Fundamental Mechanics: Quiz 6

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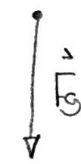
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Formulae: $\vec{F}_{net} = \sum \vec{F}_i = m\vec{a}$ $F_g = mg$ $g = 9.80 \, \text{m/s}^2$

$f_k = \mu_k n$ $f_s \leq \mu_s n$

A rock, whose mass is much less that that of the Earth, falls freely toward the surface of the Earth. Ignore air resistance and all other objects in the vicinity of Earth.

a) Is the force exerted by the rock on the Earth smaller than, larger than or equal to the force exerted by the Earth on the rock?

b) Is the acceleration of the rock smaller than, larger than or equal to the acceleration of Earth?

Explain your answers.

Rock

$\vec{F_g}$

object is falling

$\sum F_y = ma$

$\vec{F_g} = ma$

$m_{Rock} \, g = m \, a$

a.) The force of the rock on the earth is equal to the force of the Earth on the rock because of Newtons third law.

b.) Since F = ma, and the mass of the rock is much smaller than the Earths, the rock would require a larger acceleration for the forces to be equal